CONCRETE BLOCK: CHARACTERISTICS, USES AND PROBLEMS

This standard includes general information on the characteristics and common uses of concrete block and identifies typical problems associated with this material along with common causes of its deterioration.

Reference: National Park Service Preservation Brief #15: Preservation of Historic Concrete

http://www.nps.gov/history/hps/tps/briefs/brief15.pdf

INTRODUCTION

Characteristics of concrete block:

- Made from a mixture of Portland cement, blended cement, various types of aggregates, and water.
- Also referred to as concrete masonry units (CMU).
- Advantages: Inexpensive, lightweight, durable, easy to install, fireproof, low maintenance, and could be ornamented.
- Face plates were used to create a variety of surface finishes, including cobblestone, brick, ashlar and rockface (the most common type); more decorative finishes included designs of scrolls, wreaths and roping.
- Typical size manufactured is nominally for a stretcher block 8 by 8 by 16 inches; this was the standard size manufactured by 1930 (actual dimensions 8 by 7 3/4 by 15 3/4 inches).
- They may be solid or hollow with two or three cores for such stretcher blocks; various other types of standard shapes are also often available and one should consult the local market to determine availability.
- Block ends may be flat or flanged.
- Compressive strength and fire resistance of the each block is dependent upon the block’s configuration.
- Lightweight aggregates were introduced around 1917 and cinder blocks were patented.
- Advantages of using cinder blocks included its strength, ability to receive nails and ease of installation.
- Lightweight aggregates were either natural materials, by-
products or manufactured.

- Natural aggregate materials included pumice.

- By-products aggregate materials included cinders and slag; Potsco or Celocrete is one example of slag product used around 1930 in the manufacture of blocks; Waylite is another example introduced in the late 1930s.

- Manufactured aggregate materials included expanded shale, clay and slate; Haydite is one example of an expanded shale product used in the early 1920s in the manufacture of blocks.

TYPICAL USES

Typical historical uses for concrete block include:

- Foundation walls - typically rockfaced.

- Basement walls.

- Partition walls - usually plainfaced.

- Exterior walls - usually plainfaced and then often covered with stucco.

- Most concrete block was used as a back-up material or for cavity wall construction.

- Coatings are often are applied to concrete block in order to prevent water penetration; some of these include Portland cement paints, latex paints, oil- and rubber-based coatings, epoxy coatings, alkyd paints, urethanes and silicones; a single type may be selected for a specific function including its water resistance; other factors to consider might also include its resistance to ultraviolet rays, its breathability, its resistance to alkalis, and its coloration or visual appearance when applied to the block.

NATURAL OR INHERENT PROBLEMS

- Cracking: Often due to shrinkage of the concrete or movement of the wall.

- Efflorescence: Occurs when accumulations of salt are carried to the surface by water migrating through the masonry.

- Staining: Staining may appear in many forms, including dirt build-up, metallic staining or painted graffiti.

- Rising Damp: When ground water enters the wall from the base and migrates upward.

VANDALISM OR HUMAN-INDUCED PROBLEMS

- Spalling: May be caused by the composition of the concrete mixture, prolonged exposure to water which has infiltrated the wall, or mechanical failure.

END OF SECTION